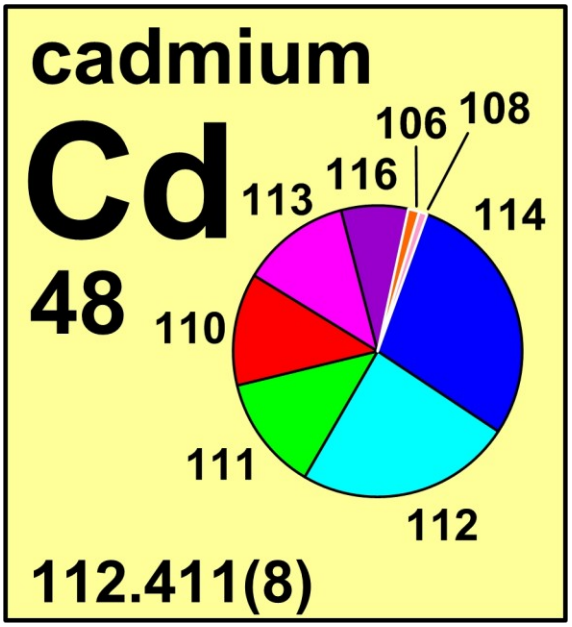
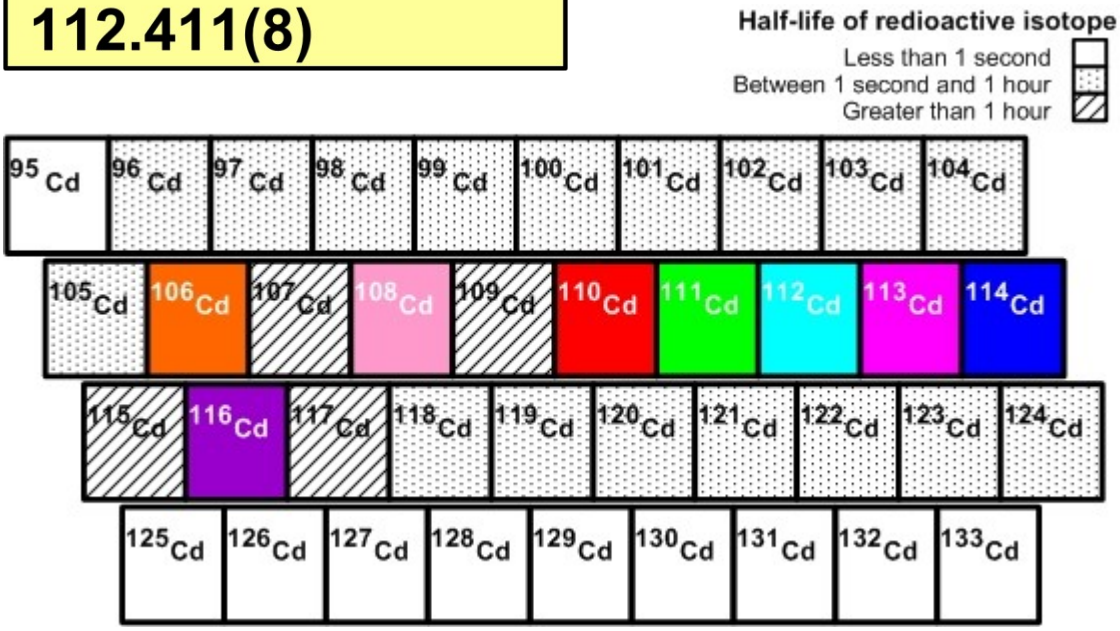
cadmium



Stable isotope	Atomic mass*	Mole fraction
^{106}Cd	105.906 459	0.0125
^{108}Cd	107.904 184	0.0089
^{110}Cd	109.903 0021	0.1249
^{111}Cd	110.904 1781	0.1280
^{112}Cd	111.902 7578	0.2413
^{113}Cd	112.904 4017	0.1222
^{114}Cd	113.903 3585	0.2873
^{116}Cd	115.904 756	0.0749

* Atomic mass given in unified atomic mass units, u.



Important applications of stable and/or radioactive isotopes

Isotopes in environmental science

1) Heavy metals accumulation is a threat to our world's water systems and the resident wildlife. Isotopically enriched foods can be valuable tools to study uptake and accumulation of metals in an animals' diet. Animals are exposed to a diet enriched in ^{106}Cd and/or other stable isotopes of metals, for example, ^{65}Cu, and ^{62}Ni for a period of time and depending on the purpose of the experiment, residence time in the gut is determined and isotopic compositions from the gut and/or feces are measured via inductively coupled plasma mass spectrometry (ICP-MS) and this information is used to measure bio-uptake and accumulation rates of metals.

Figure 1: Heavy metals accumulation is prevalent in our world's water systems and affecting the resident wildlife. The extent of that heavy metal influence is being studied using food enriched in metal stable isotopes.

2) Variability in isotopic composition of cadmium in ocean water has been identified, but is poorly understood.

Isotopes in medicine

1) ^{110}Cd can be used to produce radioisotope ^{110}In-110.
2) ^{112}Cd is used to produce the diagnostic radioisotope ^{111}In.
3) ^{109}Cd is a calibration source for 88 keV gamma radiation and is produced by ^{108}Cd.

Isotopes in physics

1) HeCd lasers use ^{110}Cd, ^{112}Cd, ^{114}Cd and ^{116}Cd to improve coherence length and power output.